

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

NOKIA TECHNOLOGIES OY,

Plaintiff,

v.

AMAZON.COM, INC., AND
AMAZON.COM SERVICES LLC., AND
TWITCH INTERACTIVE, INC.

Defendants.

C.A. No. 23-1236 (GBW)

**PLAINTIFF'S OPPOSITION TO DEFENDANTS' MOTION AND OPENING BRIEF IN
SUPPORT OF MOTION TO DISMISS PURSUANT TO FED. R. CIV. P. 12(B)(6)**

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I. STATEMENT OF THE NATURE AND STAGE OF THE PROCEEDINGS

Nokia Technologies Oy (“Nokia”) filed its 591-page Original Complaint on October 31, 2023, alleging, among other things, infringement of 15 patents by Amazon. Nokia’s complaint details the groundbreaking novelty of Nokia’s patented technologies and Amazon’s corresponding rampant infringement and flagrant misconduct. In response, Amazon filed its partial motion to dismiss alleging that six of the 15 asserted patents are invalid under 35 U.S.C. § 101 (D.I. 18).

Amazon’s motion should be denied. Amazon attacks strawmen revisions of Nokia’s patents rather than the actual, claimed innovations. Amazon’s oversimplifications, mischaracterizations, and cursory treatment of the six challenged patents falls far short of Amazon’s burden of showing by clear and convincing evidence that the challenged claims are patent ineligible, particularly given the Federal Circuit’s repeated recognition that “[d]etermining whether the [invention] is well-understood, routine, or conventional is a question of fact that cannot be resolved at the Rule 12(b)(6) stage.” *See, e.g., Cooperative Ent’mt Inc. v. Kollektive Tech., Inc.*, 50 F.4th 127, 133 (Fed. Cir. 2022).

II. SUMMARY OF ARGUMENT

1. Patent eligibility is a question of law that depends on underlying issues of fact. *See Berkheimer v. HP, Inc.*, 881 F.3d 1360, 1365 (Fed. Cir. 2018). “[P]atent eligibility may be resolved at the Rule 12 stage only if there are no plausible factual disputes after drawing all reasonable inferences from the intrinsic and Rule 12 record in favor of the non-movant.” *Id.*

2. The challenged patents are not directed to abstract ideas. Instead, the challenged patents are directed to non-abstract technological advancements that are analogous to subject matter that the Federal Circuit has routinely found to be non-abstract and patent eligible. The Court may deny Amazon’s motion on this basis alone.

3. The challenged patents are also patent eligible because each of the challenged patents contain an “inventive concept” as the claims are directed to specific technical solutions that were not well-understood, routine, or conventional at the time. Such well-pled allegations that claims are directed to an inventive concept are more than sufficient to deny Amazon’s motion. *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121, 1126-27 (Fed. Cir. 2019).

4. Amazon treats claims of the challenged patents as representative when they are not. This is an additional reason to deny Amazon’s motion. *See Berkheimer*, 881 F.3d at 1365.

III. STATEMENT OF FACTS

Each of the patents challenged by Amazon relates to specific technological solutions to problems arising in the field of video coding. The patents do not cover the concept of video coding, generically, as Amazon alleges. Instead, the challenged patents claim novel and improved ways of encoding or decoding video. The inventions are unique to video coding, without pencil and paper analogue, not capable of being accomplished in the human mind, and not directed towards any fundamental truth or economic practice. These improvements include: sub-pixel interpolation techniques, requiring fewer processing steps while enhancing accuracy; entirely new parameter set structures, aligning with the expected updating frequency of parameters in a bitstream, reducing data to be transmitted and allowing greater flexibility in parameter signaling; and reference picture tracking, enabling differentiation between reference and non-reference pictures in error situations.

Digital video sequences, like movies streaming over the Internet, are made of sequences of pictures (called frames). The illusion of motion in a video is created by rapidly displaying the frames in sequence (’469 Patent, 1:11-17). Frames are formed by image pixels, which are the smallest addressable unit of a digital video frame and can have various degrees of brightness and color (*id.*, 1:32-36). To facilitate compression and transmission of the pictures, each frame is subdivided into sections known as slices, which are themselves composed of blocks—regions of

pixels which are encoded and decoded together (*id.*, 1:61-2:5; D.I. 1, ¶ 64; '818 Patent, 1:51-55).

Because of the fast frame rate, images in consecutive frames are often similar and contain redundant information. For example, a block depicting a portion of background scenery in one frame may appear in the next frame at a slightly different location as the camera pans. This is called “temporal redundancy,” *i.e.*, referring to portions of the image that do not change substantially from one picture to the next ('469 Patent, 1:11-31). Video compression methods take advantage of temporal redundancy by coding information that allows a video playback device (decoder) to predict the content of a block of pixels in a current frame based on a previous frame, the latter of which is called a “reference frame” or “reference picture” (D.I. 1, ¶¶ 133, 144; '005 Patent, 1:14-19). Prediction based on reference frames significantly reduces the need to transmit, store, or receive redundant information, thus saving bandwidth from pixel values that will not need to be re-transmitted (*see* '469 Patent, 1:11-31, 2:37-56, 3:37-59).

A. The '469, '599, and '273 Patents

The '469, '599, and '273 Patents are in the same patent family. Each is directed to patent-eligible subject matter. In the interest of brevity, Nokia responds with respect to the '469 Patent as representative of each of its family members.¹ The '469, '599, and '273 Patents are directed to an improved technique for computing interpolated subpixel values for use in motion compensated video coding (*see* '469 Patent, 1:4-7). For example, in motion compensated video coding, a motion vector indicates how a block of pixels from a reference frame should move when predicting the next block of pixels (*see id.*, 3:37-4:15). By transmitting a motion vector instead of an entire block of pixels representing the next frame, the amount of information needed to represent the sequence

¹ Nokia does not concede the claims of the '469 Patent are substantially the same as the claims of the '599 and '273 Patents. However, all three patents are patent-eligible for similar reasons.

is reduced and bandwidth is saved (*see id.*). However, blocks do not always move by a whole number of pixels, so motion vectors are often represented with subpixel accuracy, allowing them to point “in-between” pixels of the original picture (*see id.*, 6:20-48). Because pixels are the smallest addressable unit of digital video, the values of these subpixels are determined by interpolating between the values of pixels in the reference block, a computationally intensive task (*see id.*, 6:20-48, 7:55-62).

Prior to the '469 Patent, two test models—TML5 and TML6—were proposed for interpolating between pixels to arrive at sub-pixel values, but both imposed increased complexity and cost on devices. For example, both proposals increased the number of arithmetic operations or required greater hardware complexity for achieving those operations with requisite precision (*see id.*, 8:43-53, 11:14-32, 13:20-29). The '469 patent resolves these limitations by providing “a method for sub-pixel value interpolation capable of providing satisfactory performance in both the encoder and decoder” in a way which neither TML5 nor TML6 could (*see id.*, 13:30-39).

B. The '818 Patent

Video encoders and decoders rely on different parameters that specify the encoding and decoding of video data. Transmission, storage, and reception of these parameters affects bandwidth, memory, and computational demands. In one approach, prior to the '818 Patent, parameters relevant to a given “slice” of video were transmitted in a slice header, while sequence parameters and picture parameters were transmitted in a *single* parameter set (*see, e.g.*, '818 Patent, 2:48-56). A significant problem with this prior art single parameter set concept was that in order to signal a single different parameter value, the entire parameter set had to be transmitted again even though all of the other parameter values were the same (D.I. 1, ¶ 64). Transmitting and receiving multiple substantially identical parameter sets was inefficient and caused latency and reliability issues (*id.*; '818 Patent, 3:17-28). The '818 Patent claims a specific technical

improvement to those prior video coding methods by providing a novel data structure of distinct sequence and picture parameter sets, where “parameters which are not allowed to change in a coded video sequence are included in the sequence parameter set,” parameters that are allowed to change in every picture but likely changed only every few pictures were included in a separate picture parameter set, and “[p]arameters whose value may change in every slice or whose value is likely to change in every picture, are included in the slice header” (*see, e.g.*, ’818 Patent, 4:15-29).

The ’818 Patent claims a technical solution to problems specific to coded sequences of pictures in a bitstream and improves video coder functionality. The ’818 Patent claims use of an improved data structure for transmission (and reception) of sequence and picture parameters by “split[ting] the parameter set structure [in]to multiple parameter set structures according to the persistency and target of the parameters,” with at least one picture parameter value remaining unchanged in all slice headers of a picture (D.I. 1, ¶ 66; ’818 Patent, 4:15-19). The invention results in more efficient transmission of parameter information and increased compression efficiency within an encoder and/or a decoder of streaming video (D.I. 1, ¶¶ 66-67; ’818 Patent, 6:50-59).

C. The ’005 and ’764 Patents

As discussed above, video coding techniques reduce the transmission of redundant information by predicting pictures from “reference pictures” that contain similar image content (*see, e.g.*, ’005 Patent, 1:14-19). Any loss or error in a reference picture will propagate into every other picture that relies on that reference picture, which degrades the quality of the entire video (D.I. 1, ¶¶ 135, 146). Conventional video coding technology did not include information in the bitstream to distinguish *reference* pictures (used to predict other pictures) from *non-reference* pictures (not used to predict other pictures). The result was that when *any* picture was lost or corrupted, the system was required to freeze and wait for retransmission or expend resources attempting error concealment (D.I. 1, ¶¶ 136-137). There was no ability to recognize that the lost

or corrupted picture was a non-reference picture, whose absence could be safely ignored because no other pictures were being predicted from it (*id.*).

The '005 and '764 Patents claim technical solutions to this problem, which arises only in the context of coding sequences of pictures in a bitstream. Specifically, the claims are directed to a novel technique of separately tracking reference pictures in a bitstream, which enables the differentiation between a loss of a reference picture from a loss of a non-reference picture (D.I. 1, ¶¶ 137, 148; '005 Patent, 4:3-12, cls. 1, 5; '764 Patent, cl. 1).²

IV. ARGUMENT

A. The '469, '599, and '273 Patents are patent-eligible

1. The '469, '599, and '273 Patents are not abstract.

As set forth in the Complaint, the '469 Patent “is directed to novel and unconventional improvements to motion-compensated prediction in the field of digital video coding,” and specifically “provides improvements over prior motion compensated prediction and video compression techniques that result in substantial benefits to motion prediction, video compression, video quality, and video playback” (D.I. 1, ¶ 72). Amazon incorrectly alleges that the claims of the '469 Patent “are directed to nothing more than the idea of calculating sub-pixel values using weighted sums and averages of other pixel and sub-pixel values,” and that these claims are directed to “in other words, the idea of encoding and decoding video using basic math” (D.I. 18., 11). This is a reductive mischaracterization and violates the tenant that a court should not oversimplify the claimed invention, particularly when considering a Section 101 challenge at the Rule 12 stage. *TLI Commc'ns LLC v. AV Auto., L.L.C. (In re TLI Commc'ns LLC Patent Litig.)*, 823 F.3d 607, 611

² The '005 and '764 Patents share a specification but the independent claims are meaningfully distinct with respect to subject matter eligibility, as explained herein.

(Fed. Cir. 2016) (citing *Alice*, 134 S. Ct. at 2354).

The challenged claims relate to a specific improvement to sub-pixel interpolation techniques in video coding rather than a paint-by-numbers implementation of image encoding/decoding or generic interpolation techniques. *Cf. RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1326 (Fed. Cir. 2017). The claimed improved sub-pixel interpolation technique offers significant benefits over prior art (such as TML5 and TML6): It requires fewer processor cycles, reduces the number of transistors needed to implement it in hardware, and enhances accuracy by avoiding reliance on truncated intermediate values when interpolating sub-pixels (*see* '469 Patent, 37:33-38:51). Table 1 of the '469 Patent demonstrates the measurable improvements of the claimed technique. The invention is computationally more efficient because, compared to the preceding TML5 and TML6 methodologies, the invention reduces the number of linear and 6-tap filtering operations necessary to compute the value of a sub-pixel at every sub-pixel location (*see id.*, 41:64-67). It also requires less memory (*see id.*, 40:8-38). This reduction in both computational and memory complexity directly reduces the cost and size of hardware used to practice the claims and leads to a tangible improvement in the functioning of the hardware (*see id.*, 38:5-12, 38:21-24).

Amazon relies on *RecogniCorp*, taking the position that “[t]he idea of encoding and decoding video is abstract as a matter of law” (D.I. 18, 11). Putting aside Amazon’s gross oversimplification of the claims, this overextends *RecogniCorp*, where the Federal Circuit found that a broad claim for creating a composite facial image based on a facial code “derived by performing at least one multiplication operation” was directed to the abstract idea of “encoding and decoding image data.” *See RecogniCorp* at 1326. This case does not, however, support the broad proposition that any claim relating in some way to video encoding or decoding is abstract.

A later opinion by the Federal Circuit recognizes that the claims in *RecogniCorp* “did not adequately capture the inventors’ asserted technical contribution, because the claims recited no more than ‘standard encoding and decoding, an abstract concept long utilized to transmit information.’” *Koninklijke KPN N.V. v. Gemalto M2M GmbH*, 942 F.3d 1143, 1153 (Fed. Cir. 2019). In contrast, the claims of the ’469 Patent recite specific solutions to technical problems with sub-pixel interpolation for use in motion compensation in video encoding and decoding. *See Koninklijke KPN N.V.* at 1153 (determining challenged claims “patent-eligible because they are directed to a non-abstract improvement in an existing technological process”).

2. The ’469, ’599, and ’273 Patents claim inventive concepts.

While the Court does not need to reach step two, Amazon’s step two analysis also oversimplifies the claims to avoid addressing their substance. Amazon contends that “[e]ach element of the claims simply recites an ‘interpolating’ step, without reciting any new hardware or special programming” (D.I. 18, 13). Not so. Prior to the ’469 patent, existing solutions for computing sub-pixel values, such as TML5, needed significant computational resources because sub-pixel values were heavily inter-dependent, meaning that calculating one sub-pixel’s value might necessitate the calculation of many other sub-pixels (*see* ’469 Patent, 41:4-10). Others, such as TML6, imposed significant memory burdens by requiring high-precision intermediate values be stored as precomputed sub-pixels before a final sub-pixel value could be calculated (*see id.*, 37:36-38:24, 40:27-38). The ’469 Patent, by contrast, claims an inventive approach to sub-pixel interpolation that balances reduction of computational complexity with accuracy by, for example, calculating all $\frac{1}{4}$ resolution sub-pixel values based on linear interpolation values from original pixels or $\frac{1}{2}$ pixel values (*see id.*, 37:39-41, Table 1 (reduced computational complexity)).

Far from claiming the use of “interpolation” without substantiation, as Amazon alleges, the claims describe how to arrive at $\frac{1}{4}$ sub-pixel values without the detriments of competing

techniques. For example, claim 1 recites:

c) when a value for a sub-pixel situated at a $\frac{1}{2}^N$ unit horizontal and $\frac{1}{2}^N$ unit vertical location is required, interpolating such a value by taking a weighted average of the value of a first sub-pixel or pixel situated at a $\frac{1}{2}^{N-m}$ unit horizontal and $\frac{1}{2}^{N-n}$ unit vertical location and the value of a second sub-pixel or pixel located at a $\frac{1}{2}^{N-p}$ unit horizontal and $\frac{1}{2}^{N-q}$ unit vertical location, variables m, n, p and q taking integer values in the range 1 to N such that the first and second sub-pixels or pixels are located diagonally with respect to the sub-pixel at $\frac{1}{2}^N$ unit horizontal and $\frac{1}{2}^N$ vertical location.

(*Id.*, Cl. 1). The claim articulates a specific algorithm by which to select the sub-pixels or pixels from which to interpolate other sub-pixel values. This is substantially more than generic interpolation and is a specific improvement to pre-existing interpolation techniques. The claim allows a reduction in the precision of the arithmetic required, making the computation substantially easier. This increases the speed with which the operations can be performed while also lowering the cost of hardware required (*see id.*, 38:15-24). Further, this technique enables flexibility in the computation of sub-pixel values because they can be determined by interpolation in either the horizontal or vertical directions, depending on which sub-pixel value is required (*see id.*, 38:34-51, cl. 1 at step b)).

Taken as an ordered combination in their entirety, the steps of each claim in the '469 Patent are inventive. While TML5 and TML6 arrive at sub-pixel values for motion compensation, each step of the claims at issue describes a specific association between a sub-pixel and neighboring pixel and subpixel values in a way that improves efficiency while enhancing accuracy. Amazon's overly broad summarization of each such step as "interpolation" is irrelevant in the face of the actual claim language and does not render the claims non-inventive.

B. The '818 Patent is patent-eligible

1. The '818 Patent is not abstract.

The claims of the '818 Patent are directed to specific technical improvements to video

encoding and decoding: namely a new method and device for video coding that utilizes sequence parameter sets (for parameters that are constant throughout a sequence), picture parameter sets (for parameters that likely change every few pictures but can change for each picture) and slice headers (for parameters likely to change from picture to picture and may change from slice to slice within a given picture) (D.I. 1, ¶¶ 66-67; '818 Patent, 4:15-29, 6:50-59, 7:64-9:6). This novel concept—which is an improvement over a single parameter set—results in increased efficiency and compression (*see, e.g.*, '818 Patent, 4:15-29, 6:50-59, 7:64-9:6). The claimed separation of sequence parameter sets, picture parameter sets, and inclusion of specific parameters in slice headers was a specific improvement in computer (coding) functionality over conventional technology that had only one parameter set and required repeated signaling of many unchanged parameters any time even a single parameter value changed (*see, e.g.*, '818 Patent, 6:50-7:5, 7:39-45, 3:56-58; D.I. 1, ¶¶ 66-67). Additionally, the claimed “at least one picture parameter value in a slice header” further results in reduced video file sizes because including *every* parameter “whose value is likely to change in every picture” in the picture parameter set would require a unique picture parameter set for every individual picture (*see, e.g.*, '818 Patent, 4:15-26). Including at least one picture parameter value in the slice header, as in the claims and specification, eliminates the need to repeat the picture parameter set for each picture, which in turn reduces the signaling of unchanged parameters (*see, e.g.*, '818 Patent, 4:21-24, 7:39-42).

Thus, the '818 Patent claims multiple novel improvements, each precisely the type of “specific implementation of a solution to a problem in the software arts” that the Federal Circuit has held are not abstract. *Enfish LLC v. Microsoft Corp.*, 822 F.3d 1327, 1336 (Fed. Cir. 2016) (“a specific type of data structure designed to improve the way a computer stores and retrieves data in memory” is not abstract); *Finjan, Inc. v. Blue Coat Sys.*, 879 F.3d 1299, 1305 (Fed. Cir. 2018)

(improvements to computer functionality “to do things it could not do before” are not abstract). The ’818 Patent eliminated the need to transmit an entirely new parameter set for a change to a single picture parameter value using novel signaling techniques, achieving improved compression efficiency over conventional technology (*see, e.g.*, ’818 Patent, 6:50-59, 7:39-42, 4:15-26; D.I. 1, ¶¶ 69-70). *Enfish*, 822 F.3d at 1337 (“our conclusion ... is bolstered by the specification’s teachings that the claimed invention achieves other benefits over conventional [technology]”).

Rather than addressing the technical improvements offered by the ’818 Patent, Amazon instead asserts that these specific technical solutions—the claimed signaling of video coding parameters into a sequence parameter set, picture parameter set, and slice header based on the expected frequency of change in the parameter—could somehow be performed by a *newborn* looking at pictures for similarities (D.I. 18, 18). Amazon fails to describe any serious parallels between “an innate human characteristic” (*id.*) and the signaling of video coding parameters using different techniques based on the frequency of change of the parameter as claimed in the ’818 Patent. This is just the sort of extreme oversimplification the Federal Circuit has repeatedly counseled against. *TLI Commc’ns*, 823 F.3d at 611. Amazon’s other overly simplistic analogy—classifying photos according to date—has nothing to do with parameter values used in encoding and decoding pictures for bit savings, does not consider how often different parameter values are expected to change, and could not achieve any of the data compression benefits of the ’818 Patent. Amazon’s dramatic oversimplifications highlight that there are no pen and paper analogues to the claimed invention, much less ones which can be performed by an infant. Amazon’s brief is also completely devoid of *any* analysis of the key claim limitation of “at least one picture parameter value in a slice header.” As explained above, this limitation is an important advantage over unique picture parameter sets for every individual picture (*see, e.g.*, ’818 Patent at 4:21-24).

The claimed sequence parameter sets, picture parameter sets, and inclusion of certain parameters in slice headers are “a specific type of data structure designed to improve” an overall computing system, which, as the Federal Circuit found in *Enfish*, is not abstract. 822 F.3d at 1338-39; *see also Packet Intelligence LLC v. NetScout Sys.*, 965 F.3d 1299, 1308 (Fed. Cir. 2020) (“the focus of the claims is a specific improvement in computer technology: a more granular, nuanced, and useful classification of network traffic”); *ADASA Inc. v. Avery Dennison Corp.*, 55 F.4th 900, 909 (Fed. Cir. 2022) (claims to a “data structure designed to enable technological improvements” through use of an additional data field were not abstract). Similarly to Amazon, the defendant in *Packet Intelligence* argued that the claim was “directed to the collection, comparison, and classification of information.” 965 F.3d at 1308. The Federal Circuit, however, held that the claim was not abstract because (1) the claim “purports to meet a challenge unique to computer networks,” (2) “the claimed invention could provide a granular, nuanced, and useful classification of network traffic”, and (3) “the recited invention improved quality and performance of traffic flows.” *Id.* at 1308-09.

Here, as in *Packet Intelligence*, the claims meet the challenge of efficiently updating coding parameter sets, which is unique to video coding and computing (*see, e.g.*, ’818 Patent, 6:50-59). Also, like *Packet Intelligence*, the claims identify “a granular, nuanced, and useful classification of network traffic:” namely, a structure requiring a sequence parameter set and a picture parameter set, and where at least one picture parameter value is in the slice header (*see, e.g., id.*, cl. 1). And, like *Packet Intelligence*, the specification identifies the benefits associated with the claimed data structure, including improved compression efficiency (*see, e.g., id.*, 6:50-59). Finally, like *Packet Intelligence*, the ’818 claims are not directed to the broad concept of “classifying information,” but are instead directed to a specific means of solving a problem unique to video coding— creating

new parameter set data structures that reduce transmission of repetitive information—and are therefore not abstract. *See also Througtek Co., Ltd. v. Reolink Innovation Inc. et al.*, 2024 U.S. Dist. LEXIS 20139, at *12 (D. Del. Feb. 5, 2024) (“‘specific technologic modifications to solve a problem or improve the functioning of a known system’ take the [] patent claims out of the realm of abstraction”).

2. The '818 Patent claims inventive concepts.

Should the Court reach step two (which it need not), the claims, the specification, and the well-supported factual allegations pled in Nokia’s Complaint “contain alleged inventive concepts not limited to the [purported] abstract idea” which precludes granting a motion to dismiss under Rule 12. *Coop. Entm’t*, 50 F.4th at 131. The '818 Patent claims a novel method for encoding and decoding video by use of sequence parameter sets, picture parameter sets, and inclusion of certain parameters in slice headers which is a specific technical improvement over the prior art that allows for improved transmission efficiency by reducing the repetition of unchanged parameter values (*see, e.g.*, '818 Patent, cl. 1, 4:15-31, 7:63-9:6, 6:50-59; D.I. 1, ¶¶ 66-68). The '818 Patent thus claims an inventive concept not found in the art. *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1351 (Fed. Cir. 2016) (“By taking a prior art filter solution (one-size-fits-all filter at the ISP server) and making it more dynamic and efficient (providing individualized filtering at the ISP server), the claimed invention represents a ‘software-based invention[] that improve[s] the performance of the computer system itself’”); *Cosmokey Sols. GMBH & Co. KG v. Duo Sec. LLC*, 15 F.4th 1091, 1098-1099 (Fed. Cir. 2021) (“[S]pecification descriptions of how the claim limitations provide a technical improvement over conventional means will render a claim eligible at step two, just like at step one.”).

It is irrelevant whether, as Amazon argues, “video coding was well known before the patent, and that video coding standards already used parameter sets, including parameters for

picture- and sequence-level data” (D.I. 18, 18-19). Amazon does not (and cannot) argue that *separate* sequence and picture parameter sets, or a picture parameter value in a slice header that remains unchanged in all slices of a picture, as claimed, were known. As pled in the Complaint, the claimed separation of parameter values into a sequence parameter set, picture parameter set, and slice header was not well understood, routine, or conventional, either individually or as an ordered combination (D.I. 1, ¶¶ 63-70; ’818 Patent, 4:15-31 (describing the claimed features as the “inventive concept”)).

Courts routinely decline to dismiss cases where the patent specification or complaint “raise[s] factual disputes underlying the § 101 analysis.” *Aatrix*, 882 F.3d at 1126-28. The Complaint and specification describe in great detail how the claim limitations provide a technical improvement over the prior art that was not well understood, routine, or conventional (*see e.g.*, D.I. 1, ¶¶ 63-70). *Peloton Interactive, Inc. v. Echelon Fitness, LLC*, 2020 U.S. Dist. LEXIS 118945, *10-11, 2020 WL 3640064 (D. Del. July 6, 2020) (denying motion to dismiss because “the claims of the patents at issue recite the aspects that Plaintiff alleges in the amended complaint make them inventive.”). Amazon’s allegations that the ’818 Patent does not disclose new hardware or software ignores the express disclosure in the ’818 Patent regarding the different parameter sets and their contents (D.I. 18, 18; ’818 Patent, 7:64-10:43). Furthermore, whether the components are conventional “misses the point—useful improvements to computer networks are patentable regardless of whether the network is comprised of standard computer equipment.” *Throughtek*, 2024 U.S. Dist. LEXIS 20139, at *19 (citing *Coop. Entm’t*, 50 F.4th at 135). The facts pled in Nokia’s complaint establish that the ’818 Patent claims a technical solution comprising novel data structures that improve efficiency for video encoding and decoding (D.I. 1 at ¶¶ 63-70). Amazon’s allegations demonstrate, at most, factual disputes that preclude a finding of ineligibility at this

stage. *Coop. Entm 't*, 50 F.4th at 131.

3. Claim 1 is not representative.

Claim 6 includes inventive concepts not found in Claim 1. Specifically, Claim 6 recites a technical solution with a different specific implementation, namely a *decoder* which recognizes parameters in both sequence and picture parameter sets, as well as a picture parameter value in the slice header, to enable improved compression efficiency over the prior art (*see, e.g.*, '818 Patent, cl. 6, 4:15-19, 6:50-59, 7:63-9:6; FAC, ¶ 113 (“The '818 Patent therefore provides a specific technological improvement to the functionality and capabilities of video decoding technology that results in increased compression efficiency and significant reduction in transmission bit-rate.”)). Further, the dependent claims of the '818 Patent describe distinct limitations beyond the independent claims such that they are not “substantially similar.” *Cleveland Clinic Found. v. True Health Diagnostics LLC*, 859 F.3d 1352, 1360 (Fed. Cir. 2017). As one example, dependent claim 8 requires the picture parameter set to include a reference to a sequence parameter set ('818 Patent, Cl. 8). This additional limitation further distinguishes the invention from known prior art with a single parameter set, because the prior art did not contemplate specific implementations as to how multiple nested parameter sets would reference one another.

C. The '005 and '764 Patents are patent-eligible

1. The '005 and '764 Patents are not abstract.

The '005 and '764 Patent claims are directed to a novel indicator that separately tracks the encoding order of *reference* pictures in the bitstream (D.I. 1, ¶¶ 137, 148; '005 Patent, 4:23-25, 8:15-25). Prior to the invention of the '005 and '764 Patents, if either a reference picture or a non-reference picture was lost, a video coding system was forced to freeze and wait for retransmission, which significantly degraded video quality (D.I. 1, ¶¶ 138, 149; '005 Patent, 3:56-67). The '005 and '764 Patents overcame this limitation and enabled decoders to continue decoding after the loss

of a non-reference picture without freezing or waiting—a specific improvement in computer functionality that did not exist in the prior art³ ('005 Patent, 2:29-64, 3:56-62, 4:23-36; D.I. 1, ¶¶ 137-38, 148-49). This is precisely the type of “specific implementation of a solution to a problem in the software arts” that the Federal Circuit has held is not abstract. *Enfish*, 822 F.3d at 1336; *see also Finjan*, 879 F.3d at 1305 (finding that improvements to computer functionality “to do things it could not do before” are not abstract).

The inventions of the '005 and '764 Patents function differently and better than conventional technology by allowing video decoders to differentiate between missing reference pictures and non-reference pictures (*see, e.g.*, '005 Patent, 4:23-25). By eliminating the need for the decoder to freeze and wait for the next reference picture when a non-reference picture was lost, the claimed inventions achieve increased efficiency and video quality over conventional technology (D.I. 1, ¶¶ 137-140, 148-151; '005 Patent, 4:23-25, 4:34-37). *See Enfish*, 822 F.3d at 1337 (“[O]ur conclusion that the claims are directed to an improvement of an existing technology is bolstered by the specification’s teachings that the claimed invention achieves other benefits over conventional [technology].”).

The Federal Circuit has held that claims analogous to those of the '005 and '764 Patents are directed to improvements over the prior art and are thus not abstract under *Alice*. *See ADASA*, 55 F.4th at 908 (“a specific, hardware-based RFID serial number data structure designed to enable technological improvements to the commissioning process” was not abstract); *Packet Intelligence*, 965 F.3d at 1308 (patent eligible where “prior art monitors could not identify disjointed connection

³ The '764 Patent claims further include that the sequence indicator values are independent of the number of non-reference pictures *and* non-coded pictures; whereas the '005 Patent’s sequence indicator values are independent of the number of non-reference pictures. The '764 Patent claims are therefore not abstract for the additional reason that they differentiate non-coded pictures.

flows . . . but the claimed invention could provide a granular, nuanced, and useful classification of network traffic”); *Koninklijke KPN N.V.*, 942 F.3d at 1150-53 (finding not abstract claims reciting “a specific implementation for varying the way check data is generated that improved the ability of prior art error detection systems to detect systematic errors.”); *see also Throughtek*, 2024 U.S. Dist. LEXIS 20139, at *12 (holding claims not abstract that focused on “using an image pattern on the networked device, such as a barcode or QR code . . . to establish a P2P connection without the manual entry of the networked device's identification code”). Similarly, the ’005 and ’764 Patents are directed to a specific improvement—a sequence indicator with an independent number scheme to identify reference pictures—that solves shortcomings in the prior art (D.I. 1, ¶¶ 137, 148; ’005 Patent, 4:3-12).

Amazon incorrectly argues that the ’005 and ’764 Patents are directed to “an indexing system, which amounts to *numbering*” (D.I. 18, 15). The Federal Circuit has repeatedly cautioned against such gross oversimplifications. *TLI Commc’ns*, 823 F.3d at 611 (citing *Alice*, 134 S. Ct. at 2354); *see also McRo Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016). The ’005 and ’764 Patents do not claim “numbering records to keep track of data” (D.I. 18, 16), but rather are directed to a specific way of detecting the loss of *reference* pictures in video coding. Indeed, the claims require the numbering to be done based on the reference pictures’ *encoding order* rather than the typical display order (*see, e.g.*, ’005 Patent, 8:15-25, 4:13-19, 5:15-16, 7:31-34). Amazon’s gross oversimplifications ignore these key implementation details as recited in the claims (D.I. 18, 16). Amazon is also wrong that the specification does not provide implementation detail, as the specification describes in detail exactly how to implement the invention using a “Reference Picture Order Number” (RPON) as an example (*see, e.g.*, ’005 Patent, 7:28-67, 8:40-48, 9:4-40, 10:30-11:67, Figs. 4-6).

Moreover, the problem and solution presented in the '005 and '764 Patents do not arise, or make sense, outside the realm of video coding technology. These patents do not simply claim assigning numbers to pictures (like in a coffee table book). Amazon's failed analogy to a "person looking at a stack of ten photos" with a "pencil and paper" is completely divorced from the context of video coding and the specific technical problems solved with respect to reference pictures and non-reference pictures. None of Amazon's hypothetical photos are reference pictures used to reduce the amount of data needed to represent other photos, and a person looking at those photos would have no reason to distinguish the loss of a reference picture as opposed to a non-reference picture. Nor would a person with only a pencil and paper have any means or reasons to do so.

Where, as here, "the focus of the claim is a specific and concrete technological advance, for example an improvement to a technological process or in the underlying operation of a machine, our inquiry ends and the claim is eligible." *ADASA*, 55 F.4th at 908.

2. The '005 and '764 Patents claim inventive concepts.

The claims, specification, and well-supported factual allegations pled in Nokia's Complaint also preclude dismissal under step two. *Aatrix*, 882 F.3d at 1125. The '005 and '764 Patents claim inventive concepts not found in the art that "transform[s] the [alleged] abstract idea into a patent-eligible concept." *BASCOM*, 827 F.3d at 1349.

First, "[p]atent specification descriptions of how the claim limitation provide a technical improvement over conventional means will render a claim eligible at step two, just like at step one." *Cosmokey*, 15 F.4th at 1098-99. Because conventional equipment was unable to distinguish a reference picture from a non-reference picture, a loss of any picture would result in the decoder freezing and expending resources attempting to perform error concealment (D.I. 1 at ¶¶ 136, 147; '005 Patent, 3:49-67). The claimed inventions improve error detection, allowing "decoders [to] continue decoding after a [non-reference] picture loss instead of waiting for the next [reference]

picture” (’005 Patent, 4:33-36). Accordingly, the asserted claims are directed to a “new and improved technique for producing a tangible and useful result” and, thus, “fall[] squarely outside those categories of inventions that are directed to patent-ineligible concepts.” *Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1050 (Fed. Cir. 2016).

Second, courts have consistently denied motions to dismiss where the patent specification or complaint “raise[s] factual disputes underlying the § 101 analysis.” *Aatrix*, 882 F.3d at 1126-28; *Cellspin Soft, Inc. v. Fitbit, Inc.*, 927 F.3d 1306, 1320 (Fed. Cir. 2019). Here, both the patents’ specifications and the complaint are rife with examples of the claimed inventiveness and improvement over conventional digital video coding technology (*see, e.g.*, D.I. 1, ¶¶ 132-137, 143-148; ’005 Patent, 3:49-4:50). It is undisputed that these benefits are accomplished using features present throughout the claims of both the ’005 and ’764 Patents. The facts pled in Nokia’s Complaint and the language of the patents’ specifications establish that the ’005 and ’764 Patents recite a technical solution that improves upon digital video coding technology in ways that were not routine, conventional, or well-understood as individual elements and as an ordered combination (D.I. 1, ¶¶ 136-141, 147-152). These factual assertions preclude finding ineligibility. *Aatrix*, 882 F.3d at 1125.

Third, Amazon’s argument that “other known sequence numbering systems” existed is irrelevant, as the claims of the ’005 and ’764 Patents are not directed to a generic numbering system (D.I. 18, 16). Rather, the claims are directed to the specific implementation of an indicator in video coding that separately tracks the encoding order of reference pictures, which the prior art could not do (*see, e.g.*, ’005 Patent, 3:35-67, 4:23-32). Thus, the claims describe an inventive concept, both via individual elements and their ordered combination. The new solution provides tangible benefits like fewer instances of noticeable freezing/buffering. *BASCOM*, 827 F.3d at 1350.

Finally, Amazon's assertion that the '005 and '764 Patents do not specify a technological solution for implementing the sequence indicator is incorrect. The specifications provide ample evidence that a bitstream should be updated over conventional encoders and decoders to incorporate the new sequence indicator (*e.g.*, RPON) codeword (*see, e.g.*, '005 Patent, 11:21-28).

3. Dependent Claims are Patentable for Additional Reasons.

The independent claims of the '005 and '764 Patent are not representative of the § 101 analysis because multiple dependent claims include additional limitations that are patent-eligible. For example, claims 3-4 and 13 of the '005 Patent and claims 3-4 and 7 of the '764 Patent include specific locations in the bitstream where the sequence indicator value would be located, further contradicting Amazon's assertions that the claims have no implementation detail. For another example, claims 11-12 of the '005 Patent and claims 5-6 of the '764 Patent provide further refinement and potential benefits by allowing the sequence indicator to be associated with a whole picture or part of a picture, which adds more implementation detail (*see, e.g.*, '005 Patent, 4:41-50). Again, the claims are not merely directed to numbering in general but to specific improvements to the functionality of video coding technology that allows the differentiation between reference and non-reference pictures, which was not conventional, routine, or well-understood. Conventional encoders and decoders would need to be altered in the hardware and/or software to accommodate such additions to the bitstream (*see, e.g., id.*, 11:21-28).

V. CONCLUSION

For these reasons, Amazon's motion should be denied or Nokia should be granted leave to amend its Complaint where, as here, justice requires and there is no prejudice, bad faith delay or futility. *B#OnDemand LLC v. Spotify Tech., S.A.*, 484 F. Supp. 3d 188, 207 (D. Del. 2020).

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Respectfully submitted,

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